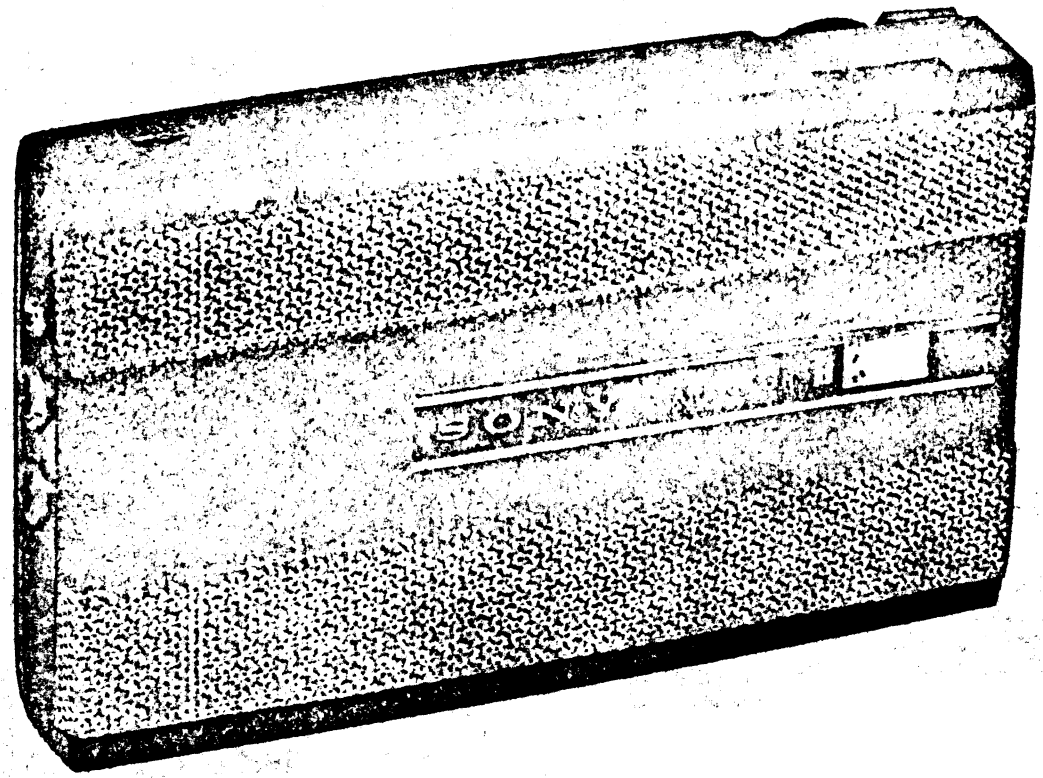
SONY SERVICING GUIDE

TR-810



Specifications for TR-810

Circuit	:	8 transistor superheterodyne
Covering range	:	535~1,605 Kc
IF frequency	:	455 Kc
Sensitivity	:	60 μV/m with built-in ferrite bar antenna
		5 μV/m with external aerial (effective height 5 m)
Selectivity	:	20 db (10 Kc off resonance)
Output power	:	50 mW (non-distorted)
Current drain	:	8 mA at 0 signal
Speaker	:	2¼" PM dynamic speaker (8Ω)
Battery	:	9 volts (BL-006 P, Eveready 216 or equivalent)
Dimmensions	:	134×82×23 mm (5¼"×3²⁵⁄₃₂"×¹⁵⁄₁₆")
Weight	:	300 gr. (10.7 ozs.)
Color	:	Black and White

AGC circuit

This model uses separated oscillator. S/N is considerably improved comparing with former pocket model as the result of using bigger sized ferrite bar antenna.

Furthermore, not only X_3 and X_4 but X_1 also joins AGC action. Principle of AGC action of X_1 is based on the nature of the mixer whose converting gain drops suddenly when the collector current reaches certain value* as it is increased.

In TR-810, AGC action is performed by the IF stage when the field intensity is weaker than 200 mV/m, while it is taken place by the mixer for stronger field intensity. By this means, the tone quality and the stability under extremely strong field intenty were much improved.

Actual operation is as follows.

Base bias current for X_1 is fed through R_{12}, which is connected in series with X_3 collector. Emitter resistor and base bias resistor of X_1 are fixed so that base voltage of X_1 increases as the result of decreased X_3 collector current due to AGC action in the IF stage. This increases X_1 collector current. Consequently the converting gain drops as the voltage between the cellector and the emitter decreases.

As described above, there is intimate relation between each bias circuit and AGC circuit. Therefore, it should be noted that a single trouble will influence upon various points.

For example, open circuit in D_1 or R_{10} will cause increase of base bias of X_3 which increases X_3 collector current.

This changes voltage and current of X_1 and X_4.

* At this point when X_1 collector current increases by 100 μA, the converting gain will decrease by approximately 20 db.

To take out circuit board from the cabinet

Remove two fixing screws on variable condenser mounting plate and one screw on the lower right of the circuit board.

Adjustment on high frequency section

Current adjustment

X_3 collector current must be 300~400 μA. This can be done by replacing R_6 (82~150 kΩ).

Printed circuit between the X_3 collector and the IFT_2 has a gap which is bridged with the solder. This gap enables one to measure current easily by connecting mili-ammeter across it after removing solder.

During voltage and current measurement, the set must be detuned to any station with the volume control set at minimum.

High frequency adjustment

The set must be adjusted to receive 520 Kc with the variable condenser set at maximum, 1,680 Kc at minimum. Tracking adjustment must be done at 620 Kc and 1,400 Kc.

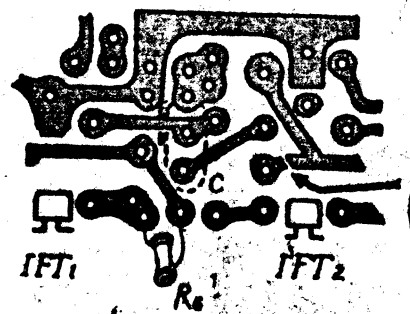
Audio stage

Transistor

2T6 group is used for audio stage. For X_4, it is recommendable to use lower α transistor than X_3 and X_4. (Value of α decreases in the order of 2T64 (2SD64)-2T65 (2SD65)-2T66 (2SD66).

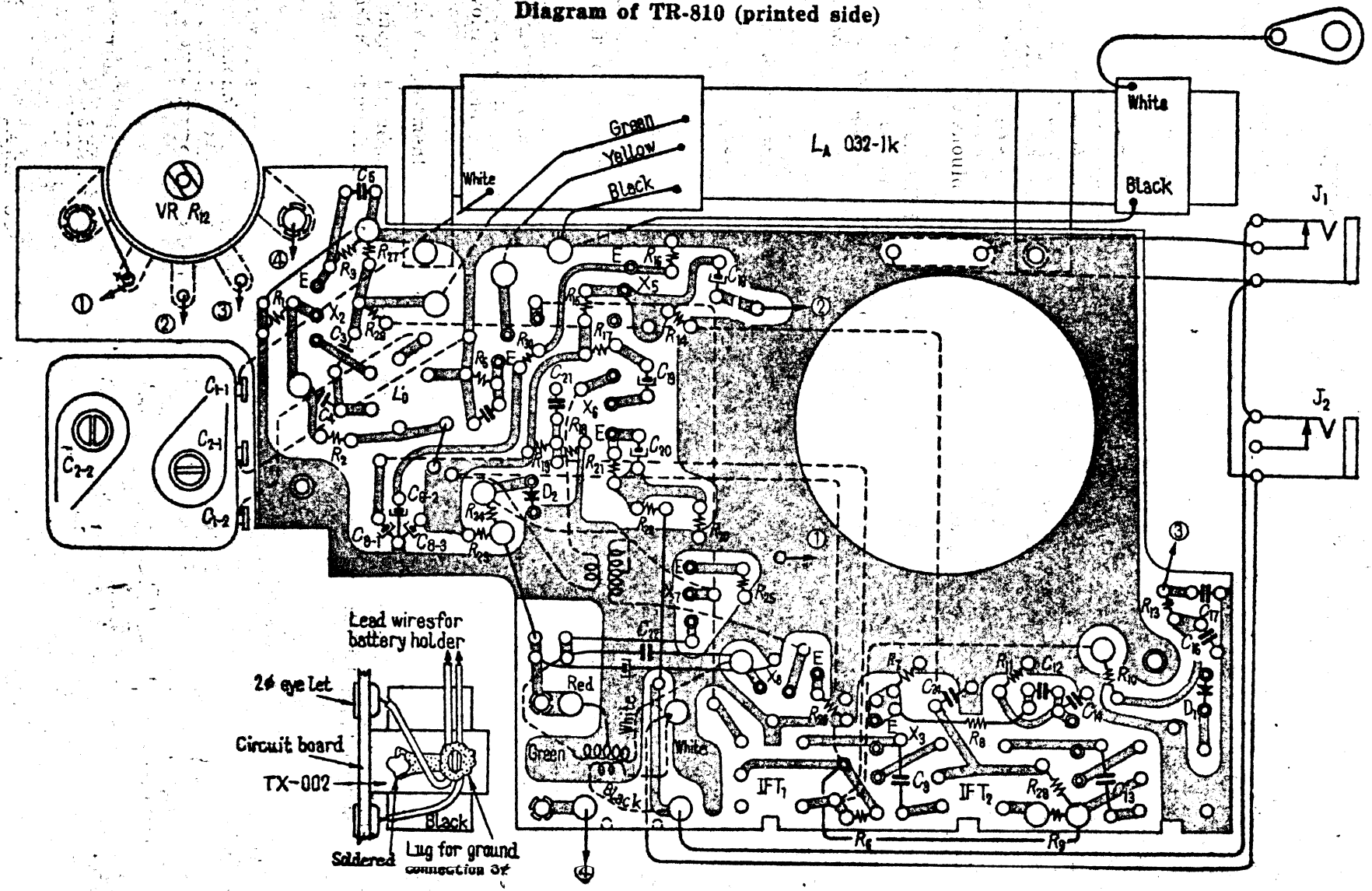
Transformer

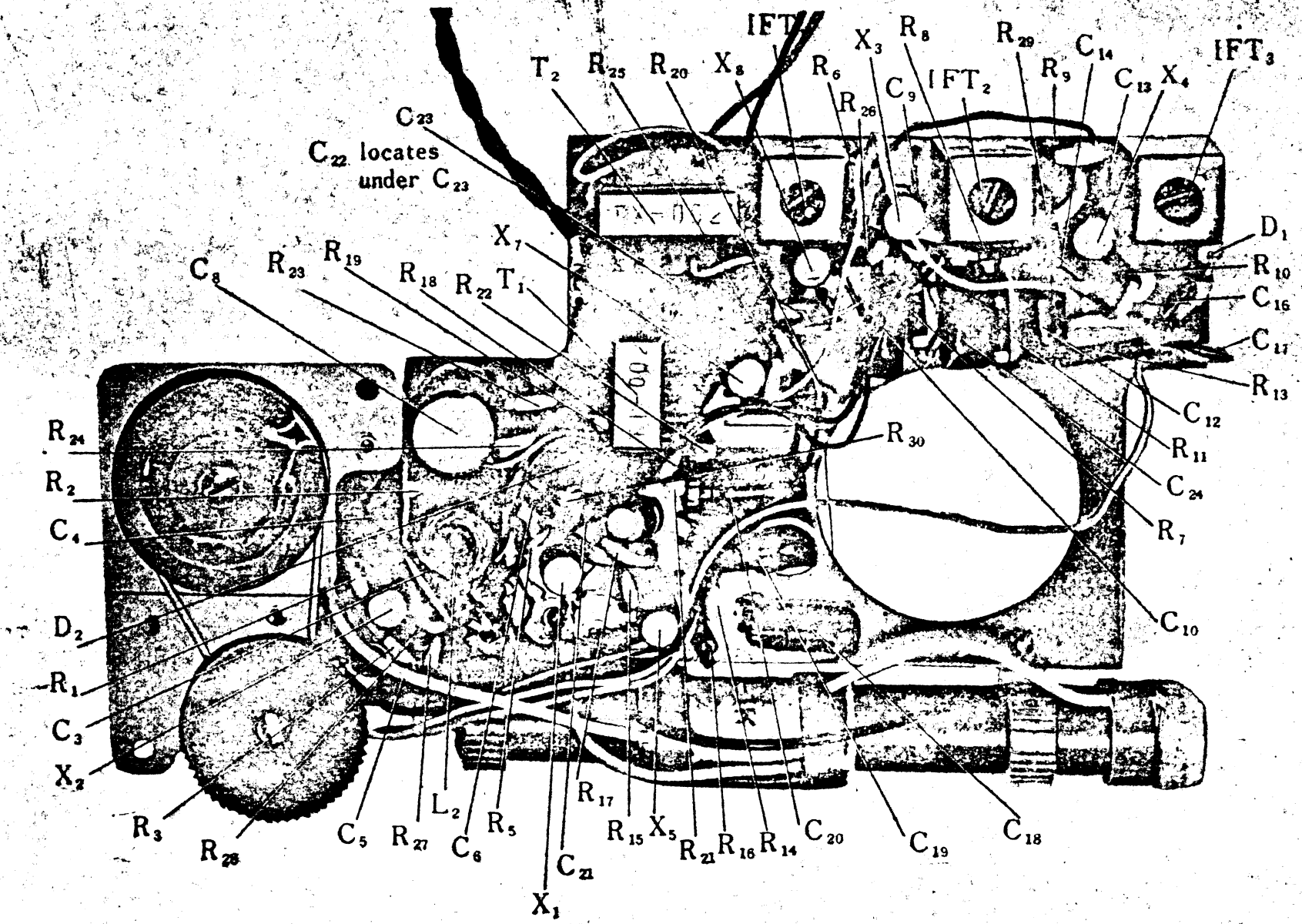
Input transformer	
TI-002-03	6 kΩ : 3 kΩ
DC resistance	500 Ω : 280 Ω
Output transformer	
TX-002-03	1.4 kΩ : 8 Ω
DC resistanse	100 Ω : 0.5 Ω



Gap
(Connect mili-ammeter across here.)

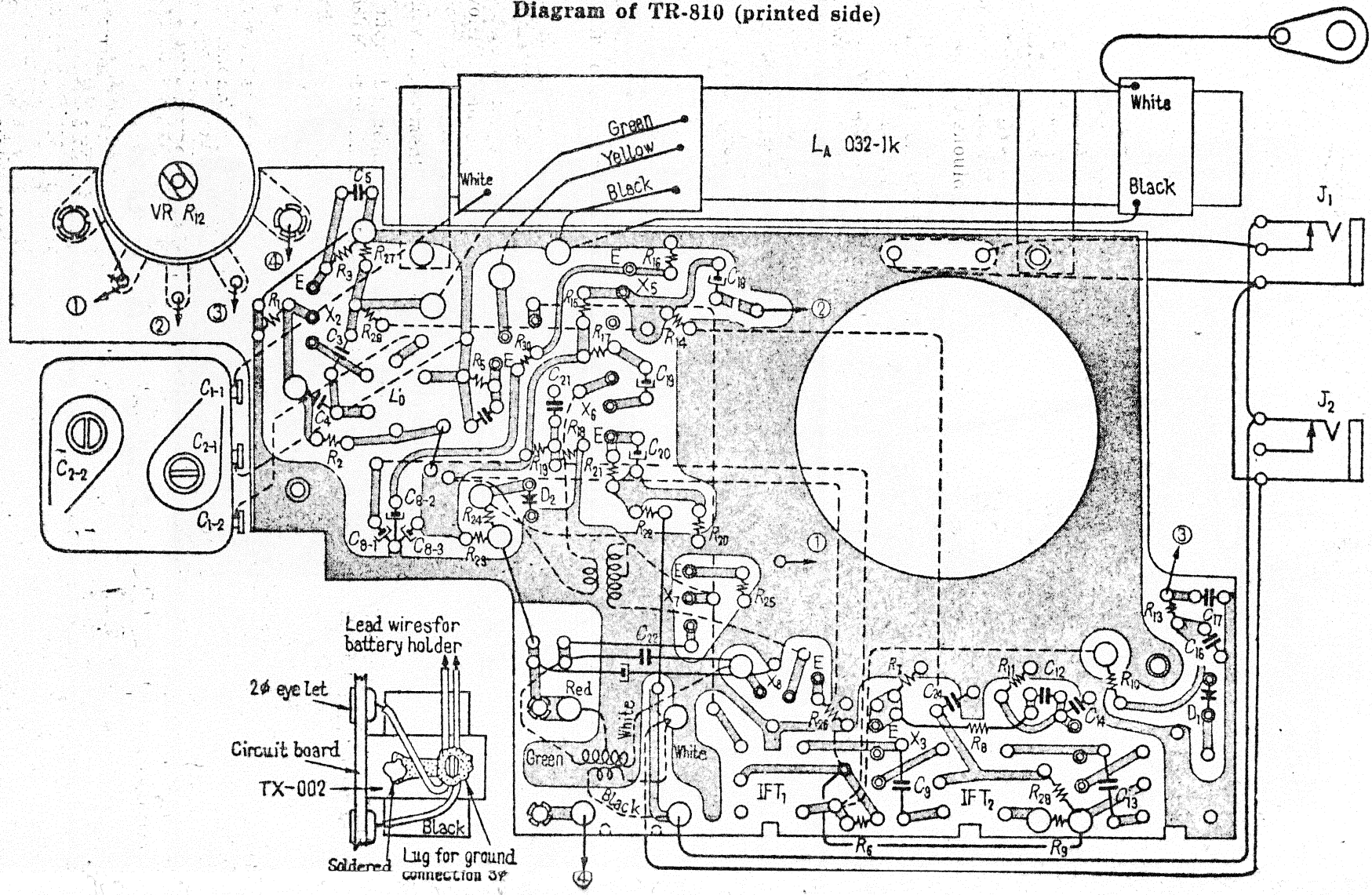
Diagram of TR-810 (printed side)

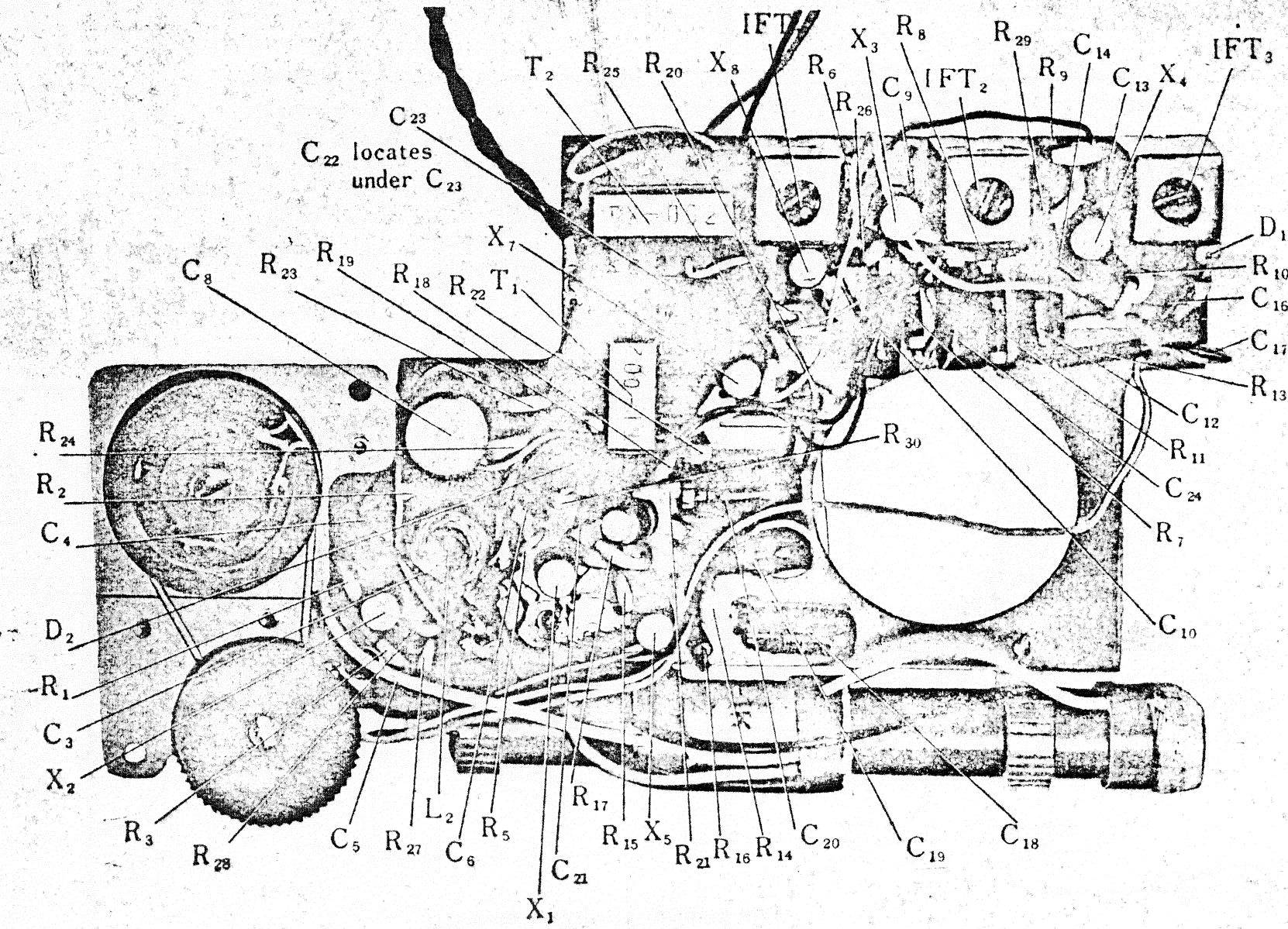




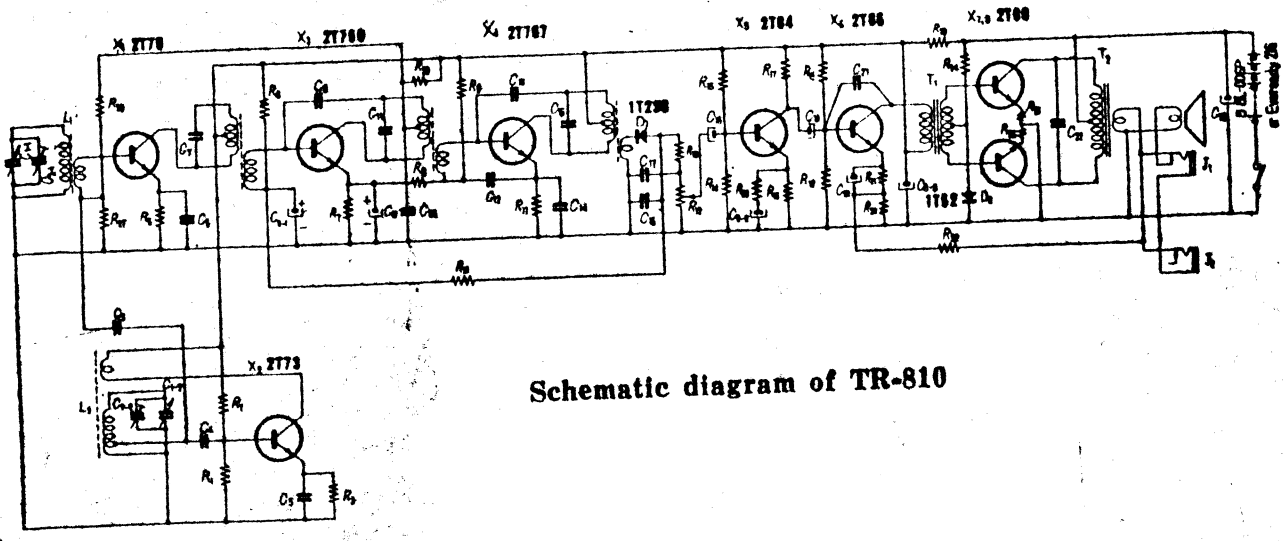
Mounting of TR-810

Diagram of TR-810 (printed side)





Mounting of TR-810



Schematic diagram of TR-810

Parts list for TR-810

Symbol	Description	Symbol	Description	Symbol	Description
L_1	Antenna coil	R_{12} ②	Volume control	C_4	0.01 μF (MXL)
L_2	Oscillator coil	R_{13}	2.2 KΩ 5% 1/8W	C_5	0.005 μF (〃)
IFT_1	LI-008-AP	R_{14}	10 KΩ 〃 〃	C_6	0.01 μF (〃)
IFT_2	LI-008-BP	R_{15}	56 KΩ 〃 〃	C_7 ③	180 PF (Titanium)
IFT_3	LI-008-CP	R_{16}	820 Ω 〃 〃	$C_{8-1,\ 8-2\ 8-3}$ ④	20 μF 10 V × 3
T_1	TI-002-03	R_{17}	820 Ω 〃 〃	C_9	2 PF (Styrol)
T_2	TX-002-03	R_{18}	10 KΩ 〃 〃	C_{10}	10 μF 3 V (Electrolytic)
SP	2¼″ 8 Ω	R_{19}	56 KΩ 〃 〃	C_{11} ③	180 PF (Styrol)
J_1	Earphone jack	R_{20}	5 Ω 〃 〃	C_{12}	0.01 μF (MXL)
J_2	〃 〃	R_{21}	680 Ω 〃 〃	C_{13}	2 PF (Titanium)
B	Battery 9 V	R_{22}	220 Ω 〃 〃	C_{14}	0.02 μF (MXL)
R_1	10 KΩ 5% 1/8 W	R_{23}	220 Ω 〃 〃	C_{15} ③	180 PF (Styrol)
R_2	56 KΩ 〃 〃	R_{24}	5.6 KΩ 〃 〃	C_{16}	0.02 μF (MXL)
R_3	2.2 KΩ 〃 〃	R_{25}	22 Ω 〃 〃	C_{17}	0.01 μF (〃)
R_4	——	R_{26}	22 Ω 〃 〃	C_{18} ⑤	5 μF 6 V (Electrolytic)
R_5	15 KΩ 〃 〃	R_{27}	100 KΩ 〃 〃	C_{19} ⑤	5 μF 6 V (〃)
R_6 ①	100 KΩ 〃 〃	R_{28}	10 KΩ 〃 〃	C_{20} ⑤	30 μF 6 V (〃)
R_7	470 Ω 〃 〃	R_{29}	10 KΩ 〃 〃	C_{21}	0.001 μF (MXL)
R_8	820 Ω 〃 〃	R_{30}	100 Ω 〃 〃	C_{22}	0.05 μF (〃)
R_9	22 KΩ 〃 〃	C_{1-1}, C_{1-2}	PVC-2X	C_{23}	12 μF 15 V or 10 μF 10 V (Electrolytic)
R_{10}	7.5 KΩ 〃 〃	C_{2-1}, C_{2-2}			
R_{11}	470 Ω 〃 〃	C_3	0.005 μF (MXL)	C_{24}	0.01 μF (MXL)

① To be adjusted ③ Built in IFT ⑤ Single ended
② With switch ④ Block type

Voltage and current distribution for TR-810

	Collector current	Collector voltage Volt	Emitter voltage Volt	Voltage between base and emitter Volt
X_1	230~270 μA	8.0_{25}	3.5_{25}	$0.07\sim0.1_1$
X_2	400~500 μA	8.0_{25}	1.0_5	$0.1\sim0.15_1$
X_3	300~400 μA	4.2_{25}	0.3_5	$0.12\sim0.18_1$
X_4	600~800 μA	8.0_{25}	0.25_5	$0.2\sim0.25_1$
X_5	0.9~1.0 mA	7.5_{25}	0.7_5	$0.1\sim0.15_1$
X_6	1.0~1.3 mA	7.5_{25}	0.7_5	$0.1\sim0.15_1$
$X_{7,8}$	750 μA	9.0_{25}	$+_1$	$0.1\sim0.15_1$

(a) Battery current: 8 mA ± 20% at 0 signal
Battery voltage: 9.0 Volts

(b) Data show approximate value at 0 signal (the set is not tuned to any station with the volume control set at minimum).

(c) Internal resistance of the voltmeter used for measurement is 20 KΩ/V.

(d) Small figures next to data show meter range.